| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/750,806 | 01/02/2004 | William H. Bridge JR. | 50277-2358 | 1803 |

| | | | EXAMINER |
|---|---|---|---|
| 29989 | 7590 | 06/30/2006 | FLEURANTIN, JEAN B |

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| ART UNIT | PAPER NUMBER |
|---|---|
| 2162 | |

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | Application No. | Applicant(s) |
| | 10/750,806 | BRIDGE ET AL. |
| **Office Action Summary** | Examiner | Art Unit | |
| | JEAN B. FLEURANTIN | 2162 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)☒ Responsive to communication(s) filed on *16 April 2004*.

2a)☐ This action is **FINAL.**      2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

## Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 January 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All  b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

## DETAILED ACTION

1.    Applicant's preliminary amendment submitted on 04/16/04, has been entered.

### *Remarks*

2.    Claims 3, 8, 12 and 17 have been amended.

a.    Claims 1-18 remain pending in this application.

### *Drawings*

3.    The Drawings submitted 1/02/04 are acknowledged.

### *Objections*

4.    Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

## *Claim Rejections - 35 USC § 101*

5.      35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As set forth in MPEP 2106:

> Products may be either machines, manufactures, or compositions of matter.
>
> A *machine* is "a concrete thing, consisting of parts or of certain devices and combinations of devices." *Burr v. Duryee*, 68 U.S. (1 Wall.) 531, 570 (1863).

As per claim 1,

Claim 1, in view of the above cited MPEP section is not statutory, because "a method for reducing the recovery time after a failure, comprising steps of <u>maintaining a checkpoint value that indicates which records of a plurality of records have to be processed after the failure, wherein the plurality of records indicate changes for a plurality of data blocks</u>" does not produce any useful and tangible result. And also all dependent claims are rejected on that basis.

Claim 9, in view of the above cited MPEP section is not statutory, because "a method for controlling an amount of time that is needed to recover after the occurrence of a database system failure, the method comprising the steps of <u>maintaining a checkpoint value that indicates which records of a plurality of records have to be processed after the failure, wherein the plurality of records indicate changes for a plurality of data blocks</u>" does not produce any useful and tangible result. And also all dependent claims are rejected on that basis.

Claim 10, in view of the above cited MPEP section is not statutory, because "a computer-readable medium carrying one or more sequences of instructions for reducing the recovery time after a failure, wherein execution of the one or more processors causes the one or more processors to perform the steps of comprising steps of maintaining a checkpoint value that indicates which records of a plurality of records have to be processed after the failure, wherein the plurality of records indicate changes for a plurality of data blocks" does not produce any useful and tangible result. And also all dependent claims are rejected on that basis.

Claim 18, in view of the above cited MPEP section is not statutory, because "a computer-readable medium carrying one or more sequences of instructions for reducing the recovery time after a failure, wherein execution of the one or more processors causes the one or more processors to perform the steps of comprising steps of maintaining a checkpoint value that indicates which records of a plurality of records have to be processed after the failure, wherein the plurality of records indicate changes for a plurality of data blocks" does not produce any useful and tangible result. And also all dependent claims are rejected on that basis.

## Claim Rejections - 35 USC § 103

6.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 6-12 and 15-18 are rejected under 35 U.S.C.103(a) as being unpatentable over applicant' background, specification page 1, paragraph [0004] to page 9, paragraph [0028], (Applicant Admitted Prior Art) ("APA") in view of U.S., Patent 5,721,918 issued to Nilsson et al., ("Nilsson").

As per claim 1, APA discloses a method comprising the steps of "maintaining a checkpoint value that indicates which records of a plurality of records have to be processed after the failure, wherein the plurality of records indicate changes for a plurality of data blocks" (i.e., data recoverable is to write redo records into a redo log file in nonvolatile memory, since the redo records containing a description of the changes that were made by a particular transaction; see page 3, paragraph [0010]);

"determining a target checkpoint value on a desired number of data block reads that will be required during a redo phase of recovery" (i.e., a checkpoint operation periodically executing, in order to reduce number of data blocks; see page 7, paragraph [0021]); and

"updating the checkpoint value based on the target checkpoint value" (i.e., updates reflecting in the database, in which redo records in the redo log file sequentially (ordered) processing (target checkpoint value); see page 5, paragraph [0016] and Fig. 1).

APA fails to explicitly disclose steps of reducing the recovery time after a failure. However, Nilsson discloses steps of reducing the recovery time after a failure (see Nilsson col. 8, lines 39-51). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of APA by reducing the recovery time after a failure as disclosed by Nilsson (see Nilsson col. 4, lines 26-36). Such a modification would allow the teachings of APA to provide an appropriate checkpoint time intervals (see Nilsson col. 3, line 40), thereby improving the accuracy of the method and system for controlling recovery downtime.

As per claim 2, APA further discloses "maintaining, in volatile memory, one or more sorted buffer queues" (i.e., buffer cache (102) containing one or more sorted buffers queues (104, 106, 108 and 110); page 4, paragraph [0013]), "wherein each sorted buffer queue includes queue entries that are inserted into said sorted buffer queue based on an index value associated with said queue entry" (i.e., buffers queues (104, 106, 108 and 110) containing data loading into (inserting into) volatile memory from data items (142, 134, 130 and 138), which are respectively data blocks (A), (B), (C) and (D) (index value); see page 4, paragraph [0013]), "wherein each queue entry reflects a change to a data block of the plurality of

data blocks" (i.e., data items (142, 134, 130 and 138) in the database reflecting changes that have been recorded; see page 4, paragraphs [0014 and 1015]).

As per claim 3, APA further discloses "wherein the one or more sorted buffer queues are one or more circular sorted buffer queues" (i.e., buffer cache (102) containing one or more sorted buffers queues (104, 106, 108 and 110); page 4, paragraph [0013]), and "wherein a modulus operation is used to identify the index value associated with each circular sorted buffer queue entry when inserting a queue entry into the circular sorted buffer queue" (i.e., buffers queues (104, 106, 108 and 110) containing data loading into (inserting into) volatile memory from data items (142, 134, 130 and 138), which are respectively data blocks (A), (B), (C) and (D) (index value); see page 4, paragraph [0013]).

As per claim 6, in addition to claim 1, APA further discloses "updating the checkpoint value to equal a byte offset in a redo log associated with the queue entry in the one or more sorted buffer queues that is associated with the last recently modified buffer in any queue entry in the one or more sorted buffer queues" (i.e., checkpoint all buffers cache (queues 104, 106, 108 and 110) containing changes (updating), in which checkpoint set equal to previously stored byte offset (redo log); see page 7, paragraph [0023]).

As per claim 7, in addition to claim 10, APA further discloses "maintaining, in volatile memory, one or more sorted buffer queues" (i.e., buffer cache (102) containing one or more sorted buffers queues (104, 106, 108 and 110); page 4, paragraph [0013]), "wherein each partially sorted buffer queue includes queue entries that are inserted into said partially sorted buffer queue based on an index value associated with said queue entry" (i.e., buffers queues (104, 106, 108 and 110) containing data loading into (inserting into) volatile memory from data items (142, 134, 130 and 138), which are respectively data blocks (A), (B), (C) and (D) (index value); see page 4, paragraph [0013]), "wherein each queue entry reflects a change to a data block of the plurality of data blocks" (i.e., data items (142, 134, 130 and 138) in the database reflecting changes that have been recorded; see page 4, paragraphs [0014 and 1015]).

As per claim 8, in addition to claim 1, APA discloses "a byte offset to an identified redo log file"

(i.e., byte offset which representing (identifying) redo record; see page 7, paragraph [0023]).

As per claim 9, APA discloses a method for "maintaining a checkpoint value that indicates which

records of a plurality of records have to be processed after the failure, wherein the plurality of records

indicate changes for a plurality of data blocks" (i.e., data recoverable is to write redo records into a redo

log file in nonvolatile memory, since the redo records containing a description of the changes that were

made by a particular transaction; see page 3, paragraph [0010]);

"determining a maximum number of data block reads that can be performed within the required

recovery time" (i.e., reducing number of data blocks, a checkpoint operation performing; see page 8,

paragraph [0025]) and

"periodically advancing the target checkpoint value based on the maximum number of data block

reads that can be performed within the required recovery time" (i.e., a checkpoint operation periodically

executing, in order to reduce number of data blocks; see page 7, paragraph [0021]); and

APA fails to explicitly disclose controlling an amount of time that needed to recover after the

occurrence of the database system failure; determining a recovery time, wherein the required recovery

time indicates a maximum length of time that is to be allowed for recovering after said database system

failure. However, Nilsson discloses a method of controlling an amount of time that needed to recover after

the occurrence of the database system failure (see Nilsson col. 4, lines 26-36); determining a recovery

time, wherein the required recovery time indicates a maximum length of time that is to be allowed for

recovering after said database system failure (see Nilsson col. 3, lines 20-27). It would have been

obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings

of APA by controlling an amount of time that needed to recover after the occurrence of the database

system failure; determining a recovery time, wherein the required recovery time indicates a maximum

length of time that is to be allowed for recovering after said database system failure as disclosed by

Nilsson (see Nilsson col. 4, lines 26-36). Such a modification would allow the teachings of APA to provide an appropriate checkpoint time intervals (see Nilsson col. 3, line 40), thereby improving the accuracy of the method and system for controlling recovery downtime.

As per claim 10, APA discloses "a computer-readable medium carrying one or more sequences of instructions, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors" (i.e., one or more processes (sequences instructions) executing on a database server; see page 2, paragraph [0007]) to perform the steps of "maintaining a checkpoint value that indicates which records of a plurality of records have to be processed after the failure, wherein the plurality of records indicate changes for a plurality of data blocks" (i.e., data recoverable is to write redo records into a redo log file in nonvolatile memory, since the redo records containing a description of the changes that were made by a particular transaction; see page 3, paragraph [0010]);

"determining a target checkpoint value on a desired number of data block reads that will be required during a redo phase of recovery" (i.e., a checkpoint operation periodically executing, in order to reduce number of data blocks; see page 7, paragraph [0021]); and

"updating the checkpoint value based on the target checkpoint value" (i.e., updates reflecting in the database, in which redo records in the redo log file sequentially (ordered) processing (target checkpoint value); see page 5, paragraph [0016] and Fig. 1).

APA fails to explicitly disclose steps of instructions for reducing the recovery time after a failure. However, Nilsson discloses steps of instructions for reducing the recovery time after a failure (see Nilsson col. 8, lines 39-51). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of APA by reducing the recovery time after a failure as disclosed by Nilsson (see Nilsson col. 4, lines 26-36). Such a modification would allow the teachings of APA to provide an appropriate checkpoint time intervals (see Nilsson col. 3, line 40), thereby improving the accuracy of the method and system for controlling recovery downtime.

As per claim 11, in addition to claim 2, APA further discloses "execution of the one or more sequences of instructions by one or more processors causes the one or more processors to further perform" (i.e., processes executing on a database server; see paragraph [0007]).

As per claim 12, the limitations of claim 12 are rejected in the analysis of claim 3, and this claim is rejected on that basis.

As per claim 15, the limitations of claim 15 are rejected in the analysis of claim 6, and this claim is rejected on that basis.

As per claim 16, in addition to claim 7, APA further discloses "execution of the one or more sequences of instructions by one or more processors causes the one or more processors to further perform" (i.e., processes executing on a database server; see paragraph [0007]).

As per claim 17, the limitations of claim 17 are rejected in the analysis of claim 8, and this claim is rejected on that basis.

As per claim 18, APA discloses "a computer-readable medium carrying one or more sequences of instructions, wherein execution of the one or more sequences of instructions by one or more processors causes" (i.e., one or more processes executing on a database server; see page 2, paragraph [0007]) causes the one or more processors to perform the steps of:

"maintaining a checkpoint value that indicates which records of a plurality of records have to be processed after the failure, wherein the plurality of records indicate changes for a plurality of data blocks" (i.e., data recoverable is to write redo records into a redo log file in nonvolatile memory, since the redo

records containing a description of the changes that were made by a particular transaction; see page 3, paragraph [0010]);

"determining a maximum number of data block reads that can be performed within the required recovery time" " (i.e., reducing number of data blocks, a checkpoint operation performing; see page 8, paragraph [0025]) and

"periodically advancing the target checkpoint value based on the maximum number of data block reads that can be performed within the required recovery time" (i.e., a checkpoint operation periodically executing, in order to reduce number of data blocks; see page 7, paragraph [0021]); and

APA fails to explicitly disclose controlling an amount of time that needed to recover after the occurrence of the database system failure; determining a recovery time, wherein the required recovery time indicates a maximum length of time that is to be allowed for recovering after said database system failure. However, Nilsson discloses a method of controlling an amount of time that needed to recover after the occurrence of the database system failure (see Nilsson col. 4, lines 26-36); determining a recovery time, wherein the required recovery time indicates a maximum length of time that is to be allowed for recovering after said database system failure (see Nilsson col. 3, lines 20-27). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of APA by controlling an amount of time that needed to recover after the occurrence of the database system failure; determining a recovery time, wherein the required recovery time indicates a maximum length of time that is to be allowed for recovering after said database system failure as disclosed by Nilsson (see Nilsson col. 4, lines 26-36). Such a modification would allow the teachings of APA to provide an appropriate checkpoint time intervals (see Nilsson col. 3, line 40), thereby improving the accuracy of the method and system for controlling recovery downtime.

b.      Claims 4-5 and 13-14 are rejected under 35 U.S.C.103(a) as being unpatentable over applicant'

background, specification page 1, paragraph [0004] to page 9, paragraph [0028], (Applicant Admitted Prior Art)

("APA") in view of U.S., Patent 5,721,918 issued to Nilsson et al., ("Nilsson") as applied to claims 1-3, 6-

12 and 15-18 above, and further in view of U.S., Patent 6,131,094 issued to Gord, ("Gord").


As per claims 4 and 13, in addition to claim 1, "execution of the one or more sequences of

instructions by one or more processors causes the one or more processors to further perform" (i.e.,

processes executing on a database server; see paragraph [0007]).

APA fails to explicitly disclose maintaining a count of the queue entries in each of the one or more

sorted buffer. However, Gord discloses a method for maintaining a count of the queue entries in each of

the one or more sorted buffer (see Gord col. 7, lines 45-54). It would have been obvious to a person of

ordinary skill in the art at the time the invention was made to modify the method of APA by maintaining a

count of the queue entries in each of the one or more sorted buffer as disclosed by Gord (see Gord col. 7,

lines 20-32 and Fig. 7). Such a modification would allow the method of APA to provide a computer

implemented method for using multiple logs buffers (see  col. 4, lines 42-44), thereby improving the

accuracy of the method and system for controlling recovery downtime.


As per claims 5 and 14, in addition to claims 1 and 4, APA fails to explicitly disclose if the count of

the queue entries in a particular sorted buffer queue of the one or more sorted buffer queues is greater

than target number of queue entries associated with the particular sorted buffer queue, then reducing the

number of queue entries in the particular sorted buffer queue to the target number of queue entries

associated with the particular sorted buffer queue. However, Gord discloses a method disclose if the

count of the queue entries in a particular sorted buffer queue of the one or more sorted buffer queues is

greater than target number of queue entries associated with the particular sorted buffer queue, then

reducing the number of queue entries in the particular sorted buffer queue to the target number of queue

entries associated with the particular sorted buffer queue (see Gord col. 7, lines 10-32). It would have

been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of APA by sorted buffer queue of the one or more sorted buffer <u>queues is greater</u> than target number of queue entries associated with the particular sorted buffer queue, then <u>reducing the number of queue entries</u> in the particular sorted buffer queue to the target number of queue entries associated with the particular sorted buffer queue as disclosed by Gord (see Gord col. 7, lines 40-57 and Fig. 7(A-C) ). Such a modification would allow the teachings of APA to provide a computer implemented method for using multiple logs buffers (see  col. 4, lines 42-44), thereby improving the accuracy of the method and system for controlling recovery downtime.

### *Prior Art*

7.      The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bohannan et al., US Pat. No. 5,864,849 relates to method for restoring a main memory database having multiple checkpoints after the database has been corrupted.

## CONTACT INFORMATION

8.      Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEAN B. FLEURANTIN whose telephone number is 571-272-4035. The examiner can normally be reached on 7:05 to 4:35.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN E BREENE can be reached on 571-272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jean Bolte Fleurantin
Patent Examiner
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June 14, 2006